

Application No. 09/751747 (Docket: MIPS.0105-00-US)
37 CFR 1.111 Amendment dated 08/26/2006
Reply to Office Action of 06/02/2006

AMENDMENTS TO THE CLAIMS

Please cancel claims 14-21 without prejudice. The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Previously Presented) An interface for transferring data between a central processing unit (CPU) and a plurality of coprocessors, the interface comprising:

an instruction bus, configured to transfer instructions to the plurality of coprocessors in an instruction transfer order, wherein particular instructions designate and direct one of the plurality of coprocessors to transfer the data to/from the CPU; and

a data bus, coupled to said instruction bus, configured to transfer the data, wherein data order signals within said data bus specify a data transfer order that differs from said instruction transfer order, and wherein said data order signals specify transfer of a data element, said data element corresponding to a specific outstanding instruction, wherein said data order is relative to outstanding instructions, said outstanding instructions being those of said particular instructions transferred to said one of the plurality of coprocessors that have not completed a data transfer;

wherein the interface keeps track of said data order, and wherein said data order signals indicate said data order, and wherein said data order signals are provided with said data element as said data element is transferred.
2. (Previously Presented) The interface as recited in claim 1 wherein the plurality of coprocessors comprises:

a first plurality of floating-point coprocessors; or

a first plurality of graphics (3-D) coprocessors; or

a second plurality of floating-point coprocessors and a second plurality of graphics (3-D) coprocessors.

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3. (Previously Presented) The interface as recited in claim 1, wherein said particular instructions comprise TO instructions, said TO instructions directing that the transfer of the data will be from the CPU to said one of the plurality of coprocessors.
4. (Previously Presented) The interface as recited in claim 3, wherein said particular instructions comprise FROM instructions, said FROM instructions directing that the transfer of the data will be to the CPU from said one of the plurality of coprocessors.
5. (Previously Presented) The interface as recited in claim 4, wherein said data bus comprises:

data TO signals, for transferring data from the CPU to one of the plurality of coprocessors; and

data FROM signals, for transferring data to the CPU from said one of the plurality of coprocessors.
6. (Previously Presented) The interface as recited in claim 5, wherein said data order signals comprise:

TO order signals, for specifying said data transfer order with respect to transfers via said data TO signals; and

FROM order signals, for specifying said data transfer order with respect to transfers via said data FROM signals.
7. (Previously Presented) The interface as recited in claim 6, wherein said TO order signals prescribe a particular outstanding TO instruction that is relative in order to all outstanding TO instructions.
8. (Previously Presented) The interface as recited in claim 6, wherein said FROM order signals prescribe a particular outstanding FROM instruction that is relative in order to all outstanding FROM instructions.

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9. (Previously Presented) The interface as recited in claim 1, wherein said data bus transfers the data over parallel signal lines to said one of the plurality of coprocessors, wherein said one of the plurality of coprocessors has multiple issue pipelines providing for parallel instruction execution.

10. (Previously Presented) A computer program product for use with a computing device, the computer program product comprising:

a computer usable medium, having computer readable program code embodied in said medium, wherein said computer readable program code, when used with the computing device, causes enablement of functions corresponding to a coprocessor interface that transfers data between CPU and a plurality of coprocessors, said computer readable program code comprising:

first program code, for causing enablement of functions corresponding to an instruction bus, said instruction bus configured to transfer instructions to said plurality of coprocessors in an instruction transfer order, wherein particular instructions designate and direct one of said plurality of coprocessors to transfer said data to/from said CPU; and

second program code, for causing enablement of functions corresponding to a data bus, said data bus configured to transfer said data, wherein data order signals within said data bus specify a data transfer order that is different from said instruction transfer order, and wherein said data order signals specify transfer of a data element, said data element corresponding to a specific outstanding instruction, wherein said data order is relative to outstanding instructions, said outstanding instructions being those of said particular instructions transferred to said one of said plurality of coprocessors that have not completed a data transfer;

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wherein the coprocessor interface keeps track of said data order, and wherein said data order signals indicate said data order, and wherein said data order signals are provided with said data element as said data element is transferred.

11. (Previously Presented) The computer program product as recited in claim 10, wherein said particular instructions comprise:

TO instructions, said TO instructions directing that the transfer of said data will be from said CPU to said one of said plurality of coprocessors; and

FROM instructions, said FROM instructions directing that the transfer of said data will be to said CPU from said one of said plurality of coprocessors.

12. (Previously Presented) The computer program product as recited in claim 11, wherein said data order signals comprise:

TO order signals, for specifying said data transfer order for a particular outstanding TO instruction that is relative in order to all outstanding TO instructions; and

FROM order signals, for specifying said data transfer order for a particular outstanding FROM instruction that is relative in order to all outstanding FROM instructions.

13. (Previously Presented) The computer program product as recited in claim 10, wherein said data bus is configured to transfer said data over parallel signal lines to particular coprocessors that have multiple issue pipelines providing for parallel instruction execution and corresponding data transfers.

14. (Cancelled)

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

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19. (Cancelled)
20. (Cancelled)
21. (Cancelled)
22. (Previously Presented) A method for transferring data between a CPU and a plurality of coprocessors, the method comprising:
 - transmitting instructions to one of the plurality of coprocessors, each of the instructions designating the one of the plurality of coprocessors, and each of the instructions directing a data transfer between the CPU and the one of the plurality of coprocessors, wherein said transmitting is provided in a specific instruction order; and
 - transferring the data in an order different from the specific instruction order, said transferring comprising:
 - specifying transfer of a data element corresponding to a specific outstanding instruction, wherein the order of said transferring is relative to outstanding instructions, the outstanding instructions being those of the instructions transmitted to the one of the plurality of coprocessors that have not completed a data transfer; and
 - providing the data order signals with the data element as the data element is transferred.
23. (Previously Presented) The method as recited in claim 22, said transmitting comprises:
 - issuing a plurality of the instructions over parallel signal lines to the one of the plurality of coprocessors; and
 - designating an execution order for the plurality of the instructions.